

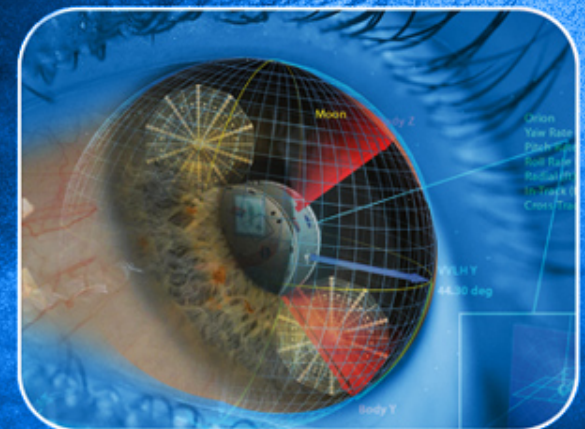
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# TOTAL ACCESS

## Processing GPS Receiver Data for Improved Fermi GLAST Navigation

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## Company Overview

- NASA's Goddard Space Flight Center (GSFC) is in Greenbelt, Maryland, approximately 6.5 miles northeast of Washington, D. C.
- GSFC is a major U.S. laboratory for developing and operating unmanned scientific spacecraft.
- The Center manages many of NASA's Earth Observation, Astronomy, and Space Physics missions, including the Hubble Space Telescope (HST)





## Program/Project Overview

- The Fermi Gamma-ray Large Area Space Telescope (GLAST) is a high-energy observatory launched June 11, 2008.
- Fermi GLAST's 5-year mission objectives:
  - Explore the most extreme environments in the Universe.
  - Search for signs of new laws of physics and what composes the mysterious Dark Matter.
  - Explain how black holes accelerate immense jets of material to nearly light speed.
  - Help crack the mysteries of gamma-ray bursts.
  - Answer long-standing questions across a broad range of topics, including solar flares, pulsars and the origin of cosmic rays.



## Challenges

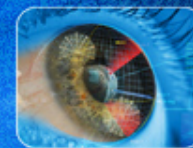
- Fermi GLAST uses a General Dynamics Viceroy GPS receiver for orbit determination – time, position & velocity
- The operations team needed to improve the Viceroy velocity estimates in order to produce accurate 6-week orbit prediction for mission planning



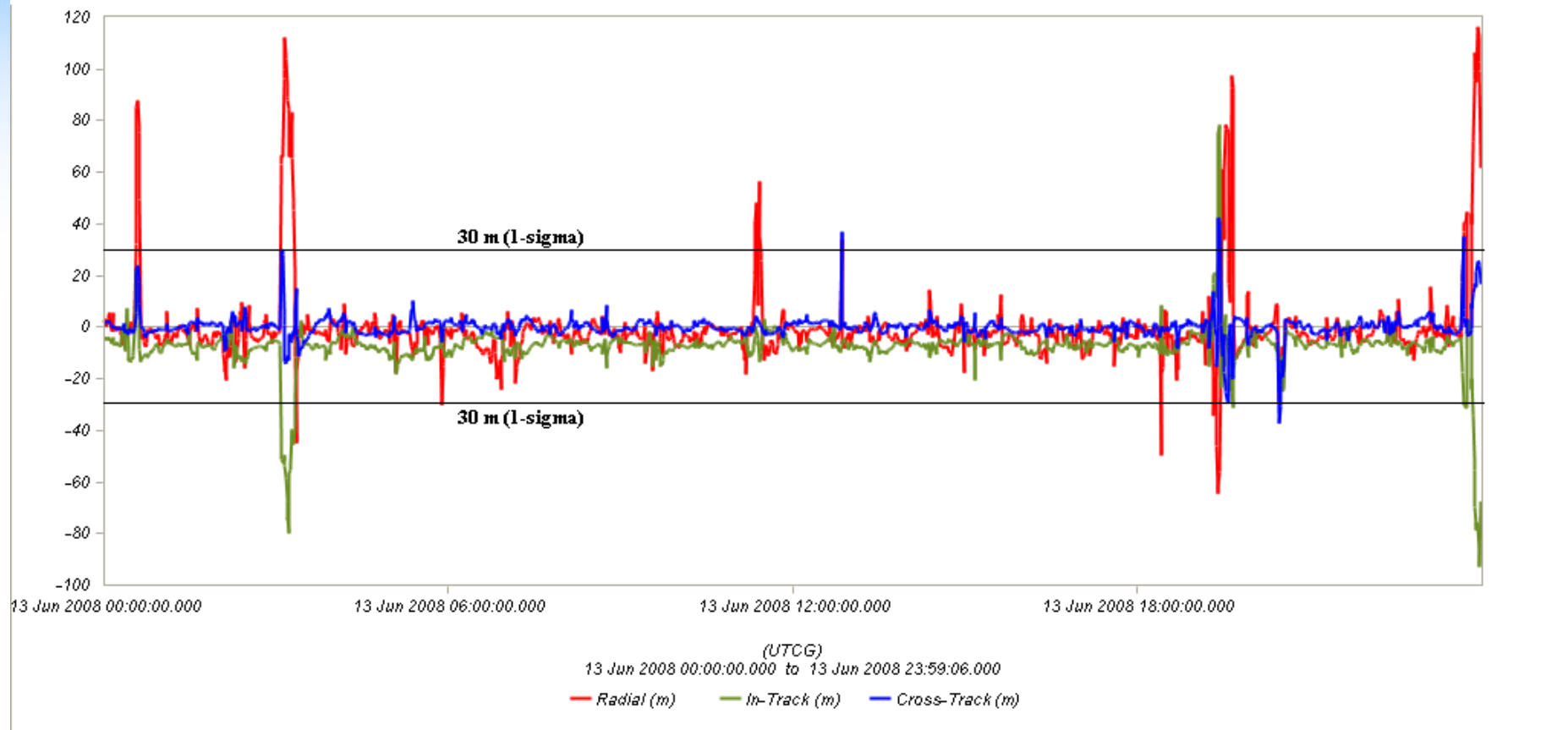
## Solution

- ODTK provided a COTS solution to filter-smooth the Viceroy orbit data
- ODTK processed data formats were readily usable with other MOC STK products (STK/Pro, STK/Scheduler, etc.)
- We considered using a GOTS product - the Goddard Trajectory Determination System (GTDS)
  - Not practical to use GTDS with the MOC software architecture





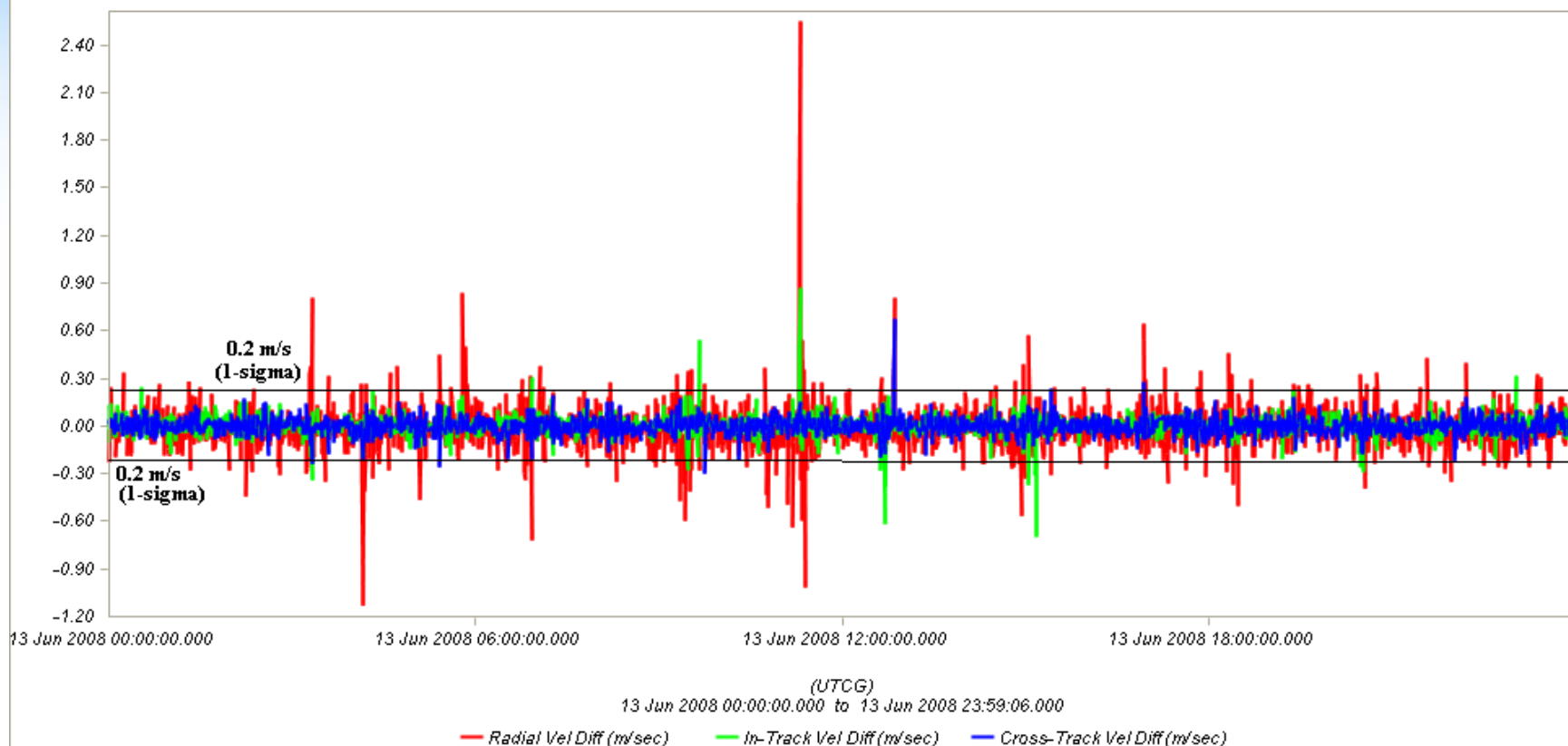
# Results





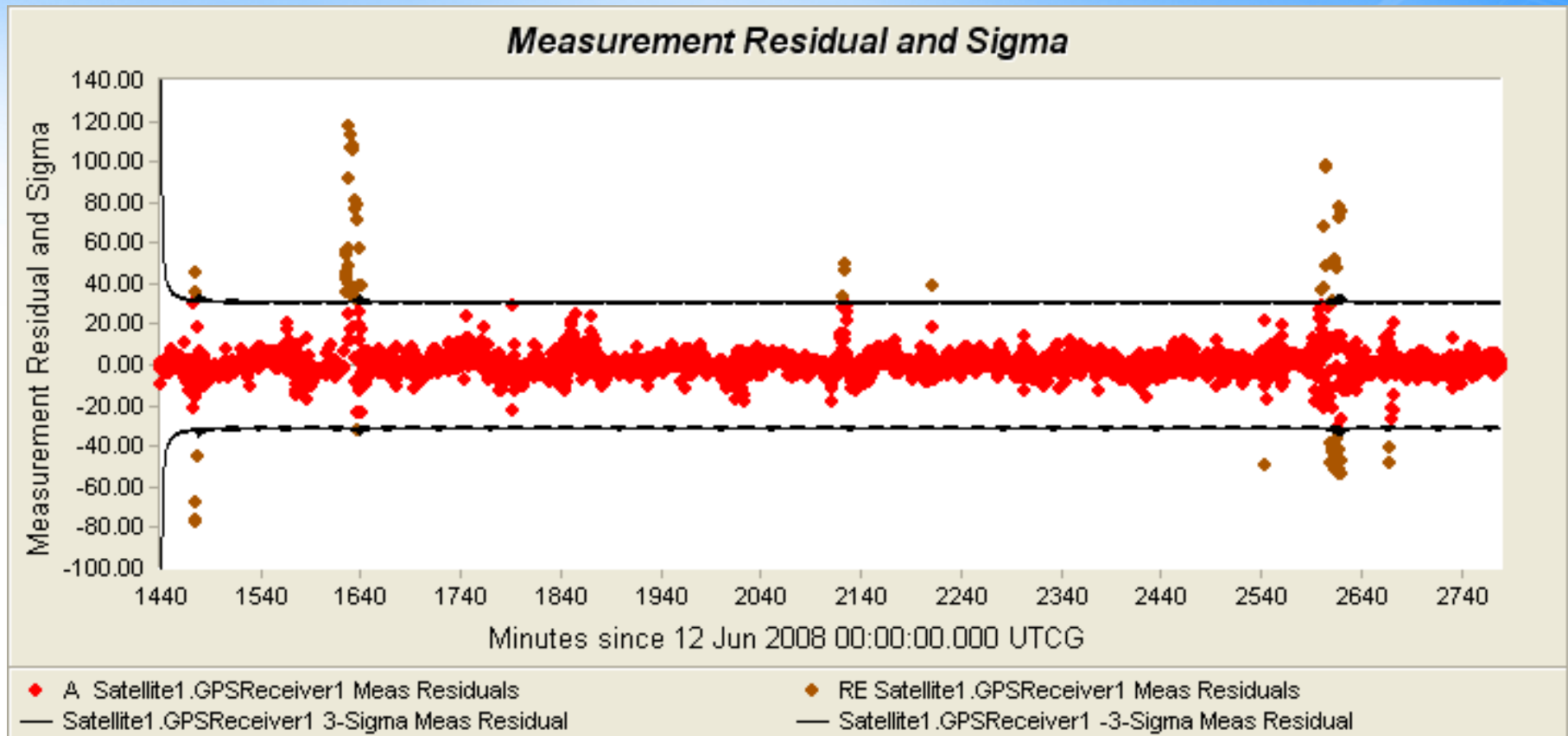
# Results

Satellite-Smoothed - 25 Jun 2008 14:52:36





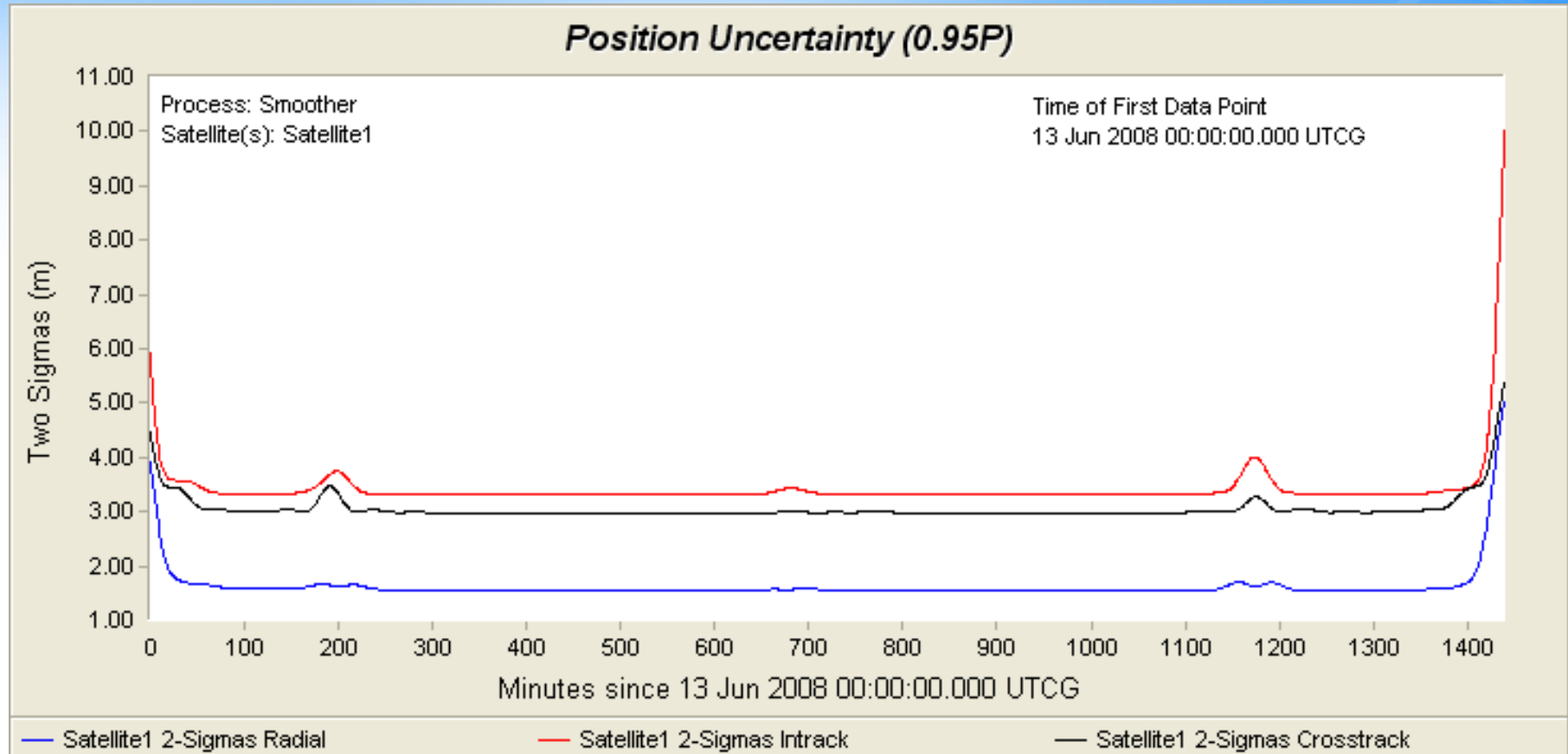
## Results





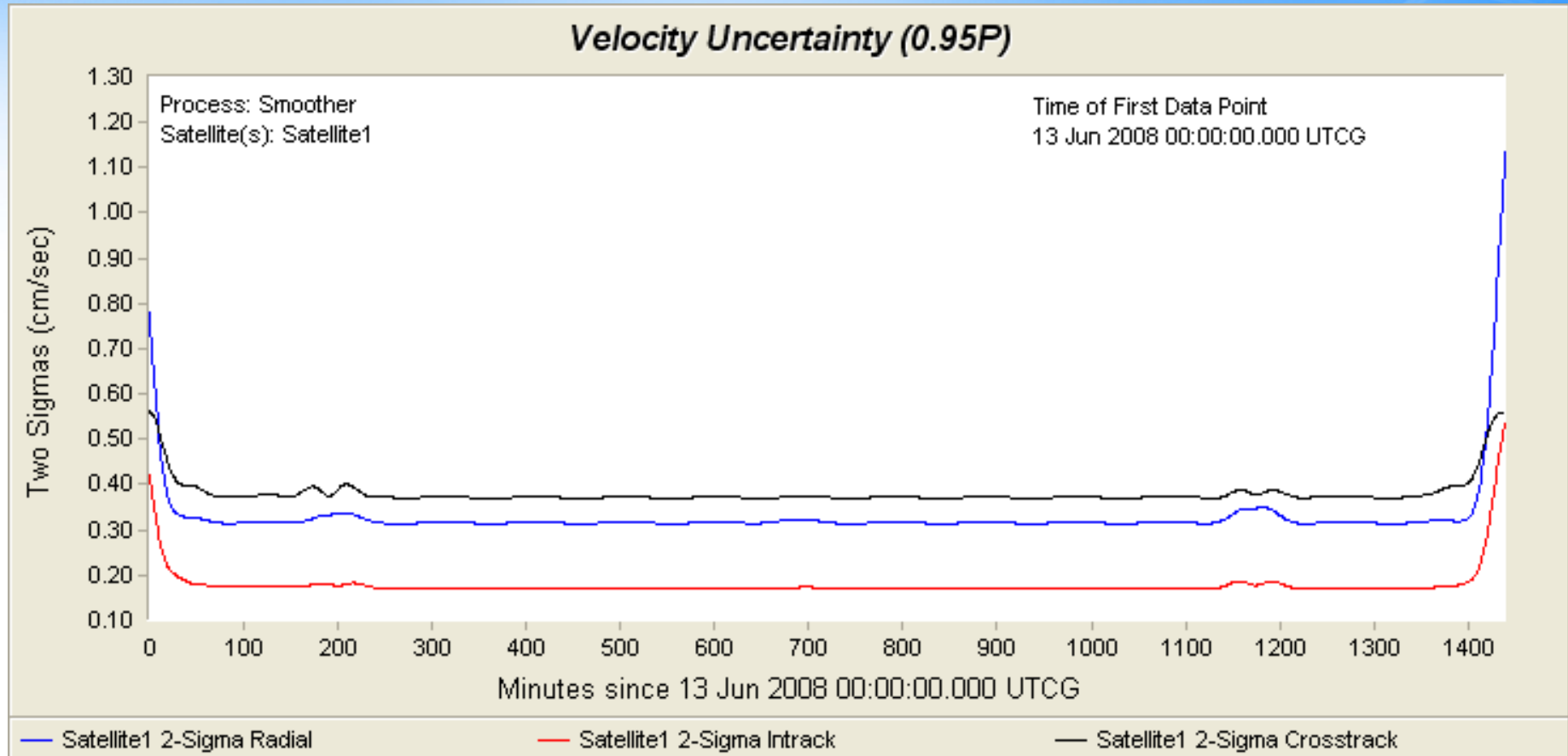


## Results





## Results





## Future Work

- ODTK is being considered for future GSFC missions that use GPS:
  - Global Precipitation Measurement (GPM) mission
  - Landsat Data Continuity Mission (LDCM)





## Contact Information

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